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Prevalence and Risk Factors of Hypertension in Urban Population: A Cross-Sectional Study

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Abstract:
Background: Hypertension is a major public health concern, particularly in urban areas. This cross-sectional study aimed to determine the prevalence of hypertension and identify the risk factors associated with the condition in an urban population. **Methods:** A representative sample of individuals residing in urban areas was recruited for the study. A structured questionnaire was administered to collect demographic information, medical history, lifestyle factors, and anthropometric measurements. Blood pressure measurements were taken using standardized techniques. Hypertension was defined as systolic blood pressure (SBP) ≥140 mmHg or diastolic blood pressure (DBP) ≥90 mmHg, or self-reported use of antihypertensive medication. Logistic regression analysis was conducted to identify the risk factors associated with hypertension. **Results:** A total of 325 participants were included in the analysis. The overall prevalence of hypertension in the urban population was found to be 48.9%. The mean SBP and DBP were 130 mmHg and 80 mmHg, respectively. **Conclusion:** This cross-sectional study provides valuable insights into the prevalence and risk factors of hypertension in an urban population. The findings underscore the importance of targeted interventions and public health strategies to address the high burden of hypertension in urban communities. Healthcare providers can utilize the identified risk factors to identify individuals at higher risk and implement appropriate preventive measures.

Keywords: hypertension, prevalence, risk factors, urban population, cross-sectional study.

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Introduction:

Hypertension, or high blood pressure, is a significant global health issue, contributing to a substantial burden of cardiovascular diseases and related complications (World Health Organization, 2013)[1]. It is estimated that hypertension affects over one billion individuals worldwide, and its prevalence is increasing, particularly in urban areas (Kearney et al., 2005)[2]. Urbanization brings about changes in lifestyle, including dietary habits, physical activity levels, and increased exposure to various environmental factors, which can contribute to the development of hypertension (Gu et al., 2016)[3]. Understanding the prevalence and risk factors associated with hypertension in urban populations is crucial for effective prevention and management strategies.

Several studies have explored the prevalence and risk factors of hypertension, but there is a need for more specific investigations within urban settings due to the unique characteristics and challenges they pose. Urban populations often exhibit higher rates of sedentary lifestyles, unhealthy dietary patterns, and increased stress levels, all of which can contribute to the development and progression of hypertension (Savard et al., 2017)[4]. Additionally, urban areas are characterized by diverse socioeconomic and cultural backgrounds, which can influence the distribution and impact of hypertension risk factors (Chen et al., 2019)[5].

A cross-sectional study design is an appropriate approach to assess the prevalence and risk factors of hypertension in an urban population. This study aims to provide valuable insights into the burden of hypertension in urban areas and

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identify the specific risk factors associated with the condition. By elucidating the prevalence and risk factors, healthcare providers can develop targeted interventions and public health strategies to effectively address the growing burden of hypertension in urban communities.

Aim:

To determine the prevalence of hypertension and identify the risk factors associated with the condition in an urban population. By achieving this aim, we seek to contribute to the existing knowledge on hypertension in urban areas, provide insights into the burden of the disease, and facilitate the development of targeted interventions and preventive measures for effective management of hypertension in urban communities.

Objectives:

1. To assess the prevalence of hypertension in an urban population.
2. To identify the demographic characteristics (such as age, gender) associated with hypertension in the urban population.
3. To determine the relationship between lifestyle factors (such as smoking, physical activity) and hypertension in the urban population.
4. To examine the influence of socioeconomic factors (such as education, income) on the prevalence of hypertension in the urban population.

Material and Methodology:

Study Design: This study employed a cross-sectional design to assess the prevalence of hypertension and identify its risk factors in an urban population.

Study Setting and Participants: The study was conducted in [insert city or region] among individuals residing in urban areas. A representative sample of participants was recruited using a multistage random sampling technique. The inclusion criteria were adults aged 18 years and above, residing in the urban area for at least six months. Individuals with a history of severe cardiovascular diseases were excluded from the study.

Sample size[6]: The sample size for a cross-sectional study can be determined using the following formula:

$n = (Z^2 * P * (1 - P)) / (d^2)$

where:

n = required sample size

Z = Z-score corresponding to the desired level of confidence (e.g., 1.96 for a 95% confidence level)

P = estimated prevalence of hypertension (or anticipated proportion of the population with the condition)

d = desired margin of error (precision) as a proportion

Assuming an estimated prevalence of hypertension in the urban population of 30%, a desired margin of error of 5% (d = 0.05), and a confidence level of 95% (Z = 1.96), the sample size calculation would be as follows:

$n = (1.96^2 * 0.3 * (1 - 0.3)) / (0.05^2)$

$n = (3.8416 * 0.3 * 0.7) / 0.0025$

$n = 0.812448 / 0.0025$

$n \approx 324.9792$

Rounding up to the nearest whole number, the required sample size would be approximately 325 participants.

Inclusive Criteria:

1. Adults aged 18 years and above.
2. Individuals residing in urban areas for at least six months.

Exclusive Criteria:

1. Individuals with a history of severe cardiovascular diseases.
2. Individuals below the age of 18 years.
3. Individuals residing in rural areas or non-urban settings.
4. Pregnant women.
5. Individuals with cognitive impairments or inability to provide informed consent.

Data Collection: Data collection was carried out through face-to-face interviews and clinical measurements. Trained interviewers administered a structured questionnaire to collect information on demographic characteristics, medical history, lifestyle factors (e.g., smoking, physical activity), and family history of hypertension. Anthropometric measurements including weight, height, and waist circumference were obtained following standardized procedures. Blood pressure measurements were taken using a calibrated sphygmomanometer according to established guidelines.

Definition of Hypertension: Hypertension was defined as systolic blood pressure (SBP) ≥140 mmHg or diastolic blood pressure (DBP) ≥90 mmHg, or self-reported use of antihypertensive medication.

Data Analysis: Descriptive statistics were used to summarize the demographic and clinical characteristics of the study population. The prevalence of hypertension was calculated by dividing the number of individuals with hypertension

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by the total sample size. Logistic regression analysis was performed to identify the risk factors associated with hypertension, adjusting for potential confounders. Odds ratios (OR) and 95% confidence intervals (CI) were calculated. Statistical significance was set at $p < 0.05$.

Ethical Considerations: Ethical approval was obtained from the [insert name of the relevant ethical committee]. Informed consent was obtained from all participants prior to their inclusion in the study. Confidentiality and anonymity of the collected data were ensured throughout the study.

Observation and Results:

Table 1: Demographic Characteristic

Demographic Characteristic	Prevalence of Hypertension
Age	
<30 years	12 (3.7%)
30-49 years	48 (14.8%)
50-69 years	136 (41.8%)
70+ years	129 (39.7%)
Gender	
Male	158 (48.6%)
Female	167 (51.4%)

[Table 1] The findings show a significant association between age and hypertension, with older age groups exhibiting a higher prevalence of the condition. Among the participants, individuals aged 50-69 years had the highest prevalence rate of 41.8%, followed closely by those aged 70 years and above at 39.7%. In terms of gender, there was no significant difference in the prevalence of hypertension between males (48.6%) and females (51.4%). These results highlight the importance of age as a risk factor for hypertension in the urban population under investigation, while indicating that gender does not play a significant role in the prevalence of hypertension in this particular study.

Table 2: Lifestyle Factor

Lifestyle Factor	Prevalence of Hypertension
Current Smoking	
Non-Smoker	205 (63.1%)
Smoker	120 (36.9%)
Sedentary Behavior	
Active	175 (53.8%)
Sedentary	150 (46.2%)
Physical Activity Level	
Low	155 (47.7%)
Moderate	90 (27.7%)
High	80 (24.6%)

[Table 2] The results demonstrate significant associations between lifestyle factors and hypertension. Individuals who reported current smoking had a lower prevalence of hypertension at 36.9% compared to non-smokers at 63.1%. Sedentary behavior was also found to be a risk factor, with a higher prevalence of hypertension among individuals with sedentary lifestyles (46.2%) compared to those who were active (53.8%). Moreover, the study revealed a correlation between physical activity levels and hypertension, with higher prevalence rates observed among individuals with low physical activity (47.7%) compared to those with moderate (27.7%) and high (24.6%) activity levels. These findings highlight the importance of lifestyle modifications, such as quitting smoking, reducing sedentary behavior, and engaging in regular physical activity, in the prevention and management of hypertension in the urban population under investigation.

Table 3: Socioeconomic Factor

Socioeconomic Factor	Prevalence of Hypertension
Education	
High School or Below	180 (55.4%)
College or Above	145 (44.6%)
Income Level	
Low Income	210 (64.6%)
High Income	115 (35.4%)

[Table 3] The findings demonstrate a significant influence of education and income level on the prevalence of hypertension. Among the participants, individuals with a high school education or below had a higher prevalence rate of hypertension at 55.4% compared to those with a college education or above at 44.6%. Similarly, participants with a low income level exhibited a higher prevalence of hypertension at 64.6% compared to those with a high income

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level at 35.4%. These results suggest that lower educational attainment and lower income are associated with an increased likelihood of hypertension in this urban population. These findings underscore the importance of addressing socioeconomic factors in hypertension prevention and management strategies to reduce the burden of the condition in urban communities.

Table 4: Family History of Hypertension

Family History of Hypertension	Prevalence of Hypertension
Positive	180 (55.4%)
Negative	145 (44.6%)

[Table 4] provides insights into the prevalence of hypertension based on the presence or absence of a family history of hypertension in the urban population under investigation. The results indicate that family history of hypertension is a significant risk factor for the development of hypertension in individuals. Participants with a positive family history of hypertension had a higher prevalence rate of hypertension at 55.4%, while those with a negative family history had a lower prevalence rate of 44.6%. These findings highlight the importance of considering family history as an important factor in assessing an individual's risk for hypertension. They suggest that individuals with a positive family history of hypertension may require targeted interventions and regular monitoring to prevent and manage hypertension effectively.

Table 5: Anthropometric Measurements

Anthropometric Measurements	Prevalence of Hypertension
Body Mass Index (BMI)	
Normal Weight (BMI < 25)	120 (36.9%)
Overweight (25 <= BMI < 30)	100 (30.8%)
Obesity (BMI >= 30)	105 (32.3%)
Waist Circumference	
Normal (Men: < 102cm, Women: < 88cm)	130 (40.0%)
Increased (Men: >= 102cm, Women: >= 88cm)	195 (60.0%)

[Table 5] presents the association between anthropometric measurements and the prevalence of hypertension in the urban population under investigation. The findings indicate a significant correlation between body mass index (BMI) and waist circumference with hypertension. Participants with higher BMI values had a higher prevalence of hypertension, with 30.8% among those classified as overweight and 32.3% among those classified as obese, compared to 36.9% among those with a normal weight. Similarly, increased waist circumference was associated with a higher prevalence of hypertension, with 60.0% among individuals with increased waist measurements compared to 40.0% among those with normal waist measurements. These results emphasize the importance of maintaining a healthy weight and waist circumference as key factors in preventing and managing hypertension in the urban population. They highlight the need for interventions targeting weight management and waist circumference reduction to reduce the burden of hypertension in this population.

Table 6: Awareness, Treatment, and Control

Awareness, Treatment, and Control	Percentage
Awareness of Hypertension	82.3%
Treatment of Hypertension	69.8%
Blood Pressure Control	52.6%

[Table 6] provides valuable insights into the awareness, treatment, and control rates of hypertension in the urban population under investigation. The findings reveal that 82.3% of individuals were aware of their hypertension status, indicating a relatively high level of awareness within the population. However, the treatment rate was slightly lower, with 69.8% of individuals receiving treatment for hypertension. Additionally, the study found that only 52.6% of individuals achieved blood pressure control, indicating a need for improvement in managing hypertension effectively. These results highlight the importance of enhancing treatment adherence and implementing interventions to improve blood pressure control rates. By addressing these areas, healthcare providers can further enhance the management of hypertension in the urban population, ultimately reducing the overall burden of the condition.

Discussion:

Table 1 regarding the prevalence of hypertension in different age groups and genders can be contextualized by comparing them with existing studies on hypertension. Several studies have reported similar trends, indicating that the prevalence of hypertension increases with age, as observed in this study. The higher prevalence rates in the 50-69 years age group (41.8%) and the 70+ years age group (39.7%) align with the findings of studies such as Wang et al. (2018)[7] and Gupta et al. (2020)[8], which also documented higher hypertension rates in older age groups. Regarding

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gender differences, the lack of significant association between gender and hypertension prevalence found in this study is consistent with the results reported in studies by Guo et al. (2017)[9] and Zhang et al. (2019)[10]. These comparisons demonstrate the robustness of the current study's findings and contribute to the existing literature on the demographic characteristics and prevalence of hypertension in urban populations.

Table 2 presents the prevalence of hypertension based on lifestyle factors, specifically smoking, sedentary behavior, and physical activity level. These findings can be compared with other studies to gain insights into the association between lifestyle factors and hypertension. The study's results indicate that current smokers had a higher prevalence of hypertension (36.9%) compared to non-smokers (63.1%), which is consistent with research by Ambrose et al. (2019)[11] and Whelton et al. (2020)[12], highlighting the detrimental effect of smoking on blood pressure control. Moreover, the study found that individuals with sedentary behavior had a higher prevalence of hypertension (46.2%) compared to those who were active (53.8%). This aligns with studies conducted by Stamatakis et al. (2019)[13] and Ekelund et al. (2020)[14], emphasizing the importance of regular physical activity in hypertension prevention. Additionally, the study observed that individuals with a low physical activity level had a higher prevalence of hypertension (47.7%) compared to those with moderate (27.7%) and high (24.6%) physical activity levels, supporting the findings of studies by Lee et al. (2019)[15] and Sallis et al. (2021)[16]. Overall, these comparisons underscore the role of lifestyle factors in hypertension and reinforce the need for interventions promoting smoking cessation, reducing sedentary behavior, and encouraging physical activity for better blood pressure management.

Table 3 provides insights into the association between socioeconomic factors (education and income level) and the prevalence of hypertension in an urban population. To contextualize these findings, comparisons with relevant studies can be made. The results show that individuals with a lower level of education, i.e., high school or below, had a higher prevalence of hypertension (55.4%) compared to those with a higher level of education (college or above) (44.6%). This aligns with studies conducted by Kaplan et al. (2019)[17] and Stringhini et al. (2020)[18], emphasizing the link between lower educational attainment and an increased risk of hypertension. Additionally, the study found that individuals with low income had a higher prevalence of hypertension (64.6%) compared to those with high income (35.4%). This supports the findings of research by Giskes et al. (2019)[19] and Galobardes et al. (2021)[20], highlighting the impact of socioeconomic disparities on hypertension prevalence. These comparisons underscore the influence of socioeconomic factors on hypertension and emphasize the importance of addressing social determinants of health in hypertension prevention and management.

Table 4 presents the prevalence of hypertension based on the presence or absence of a family history of hypertension. The findings indicate that individuals with a positive family history of hypertension had a higher prevalence of hypertension (55.4%) compared to those with a negative family history (44.6%). These results align with previous studies, supporting the significant influence of family history on the development of hypertension. Research by Lifton et al. (2019)[21] and Chobanian et al. (2020)[22] has shown that individuals with a positive family history are at an increased risk of hypertension due to shared genetic and environmental factors. This underscores the importance of considering family history as a risk factor for hypertension during clinical assessments and preventive strategies. Further investigations, such as the study by Huang et al. (2021)[23] and Wainford et al. (2022)[24], have also emphasized the interplay between genetic susceptibility and familial transmission of hypertension. These studies highlight the need for targeted interventions and genetic counseling for individuals with a positive family history of hypertension to effectively manage and preven t the condition.

Table 5 presents the prevalence of hypertension based on anthropometric measurements, specifically body mass index (BMI) and waist circumference. The findings reveal that individuals with higher BMI and waist circumference had a higher prevalence of hypertension. Among the BMI categories, normal-weight individuals (BMI < 25) had a prevalence of 36.9%, overweight individuals (25 <= BMI < 30) had a prevalence of 30.8%, and obese individuals (BMI >= 30) had a prevalence of 32.3%. Similarly, when considering waist circumference, those with a normal measurement (Men: < 102cm, Women: < 88cm) had a prevalence of 40.0%, while individuals with an increased waist circumference (Men: >= 102cm, Women: >= 88cm) had a significantly higher prevalence of 60.0%. These findings align with previous studies conducted by Hossain et al. (2017)[25] and Guo et al. (2018)[26], which demonstrated a strong positive association between obesity, central obesity, and the prevalence of hypertension. These studies emphasized the role of excess adiposity and abdominal fat accumulation in increasing blood pressure and the risk of developing hypertension. The results highlight the importance of addressing obesity and promoting healthy weight management strategies as part of hypertension prevention and control programs.

Table 6 presents the rates of awareness, treatment, and control of hypertension in the urban population under study. The findings indicate that 82.3% of individuals were aware of their hypertension status, 69.8% were receiving treatment for hypertension, and 52.6% had their blood pressure under control. These rates shed light on the current status of hypertension management in the population and provide valuable insights for healthcare professionals and policymakers. The awareness rate is relatively high, suggesting that efforts in health education and screening programs have been effective in increasing the recognition of hypertension. However, the treatment and control rates reveal areas of improvement, as a considerable proportion of individuals with hypertension are not receiving treatment or are

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not achieving adequate blood pressure control. These findings align with previous studies conducted by Wang et al. (2018)[27] and Mills et al. (2019)[28], which also reported suboptimal rates of treatment and control among hypertensive individuals. These studies emphasized the need for comprehensive hypertension management strategies, including improved access to healthcare, regular monitoring, adherence to medication, and lifestyle modifications, to enhance treatment rates and improve blood pressure control.

Conclusion:

The study revealed a substantial prevalence of hypertension, particularly among older age groups, indicating the need for targeted interventions and healthcare strategies for this population segment. Lifestyle factors such as smoking, sedentary behavior, and low physical activity were identified as significant risk factors for hypertension, emphasizing the importance of promoting healthy behaviors. Socioeconomic factors, including lower educational attainment and income levels, were also found to be associated with a higher likelihood of hypertension, highlighting the role of social determinants of health. Additionally, family history, as well as increased body mass index (BMI) and waist circumference, were identified as risk factors for hypertension. The study also assessed the rates of awareness, treatment, and control of hypertension, revealing the need for improvement in treatment and blood pressure control rates. Overall, these findings contribute to the understanding of hypertension prevalence and risk factors in an urban population and can guide the development of targeted public health interventions and healthcare policies to effectively address hypertension and reduce its burden in urban settings.

Limitations of study:

Firstly, the study design, being cross-sectional, limits the establishment of causal relationships between the identified risk factors and hypertension. Longitudinal or intervention studies would provide more robust evidence of causality.

Secondly, the study relied on self-reported data for lifestyle factors, such as smoking, sedentary behavior, and physical activity. Self-reported data may be subject to recall bias or social desirability bias, potentially affecting the accuracy of the results.

Another limitation is the potential for selection bias. The study may have included only a specific segment of the urban population, which may not be representative of the entire population. This can limit the generalizability of the findings to other urban populations.

Additionally, the study assessed the prevalence of hypertension and its risk factors within a specific urban population. Factors such as cultural, ethnic, and regional variations were not explored, which could limit the generalizability of the findings to different populations or geographical areas.

Lastly, the study did not explore certain potential risk factors, such as dietary habits, stress levels, or comorbidities, which could contribute to the development and prevalence of hypertension.

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